



Virginia's Offshore Wind Supply Chain and Service Industry Opportunity

July 25, 2018

Agenda

Virginia's Offshore Wind Supply Chain and Service Industry Opportunity

- Virginia's Opportunity
- Virginia's Advantages
- Virginia's Offshore Wind History
- Collaboration
- Supply Chain and Service Industry
- Virginia Offshore Wind Team
- Get Involved

Virginia's Opportunity

Offshore Wind Supply Chain and Service Industry

Opportunity

Offshore Wind Supply Chain and Service Industry

Background

- The offshore wind energy market is just emerging in North America.
- With a potential build-out of at least 20,000 MW of installed capacity (or 2,000-3,000 wind turbines) along the East Coast over the next two decades, Virginia is well-positioned as a prime location for the offshore wind supply chain and service industry.
- As the demand for wind energy increases, experts predict that over 14,000 jobs will be created in the Virginia in the construction, maintenance, manufacturing and other service-related industries.
- Offshore wind components include: blades, generators, nacelles, towers, foundations, cables and construction staging.

The Opportunity in Virginia

The Virginia Offshore Wind Team, led by the Department of Mines, Minerals and Energy, recognizes the long-term economic development opportunity to capitalize on the Commonwealth's logistical and workforce advantage.

In fact, the Virginia Offshore Wind Team regularly hosts site tours with globally recognized offshore wind developers, procurement and logistics experts, European foundation fabricators and other potential supply chain businesses.

Opportunity



“Hampton Roads’ unmatched port infrastructure and high--quality maritime workforce make the region an ideal location for offshore wind energy development. Virginia should be the prime location for the offshore wind industry, from the supply chain to the full build-out of our offshore wind assets off the coast.”

— Governor Ralph Northam

Opportunity



“Virginia is poised to capitalize on the start of a 50--year industry that will stretch up and down the East Coast. From a logistics standpoint, locating the offshore wind supply- chain in Virginia just makes sense.”

— Secretary of Commerce and Trade Brian Ball

Virginia's Advantages

Advantages

Virginia's Hampton Roads region offers a number of unique competitive advantages over other offshore wind business locations along the East Coast.

#1 Pro-Business Climate	#2 Strategic Geographic Location	#3 Unmatched Port Infrastructure
#4 Congestion-Free Navigation	#5 Progressive Energy Policy Stance	#6 America's Largest Shipbuilding Industry
#7 Zero Air Draft Restrictions	#8 High-Quality Maritime Workforce	#9 Abundant Quayside Real Estate

Advantages

#1: Pro-Business Climate



CNBC ranks Virginia as the fourth top state in the nation and the first on the East Coast for business. Virginia leads the way in education and workforce development to support its thriving economy.

Advantages

#2: Strategic Geographic Location



With commercial offshore wind leases located off the coasts of NJ, DE, MD, VA, and NC at a travel time of less than 20 hours by installation vessels traveling at 10 knots, Virginia's port assets are strategically located in the Mid-Atlantic with direct open access.

Advantages

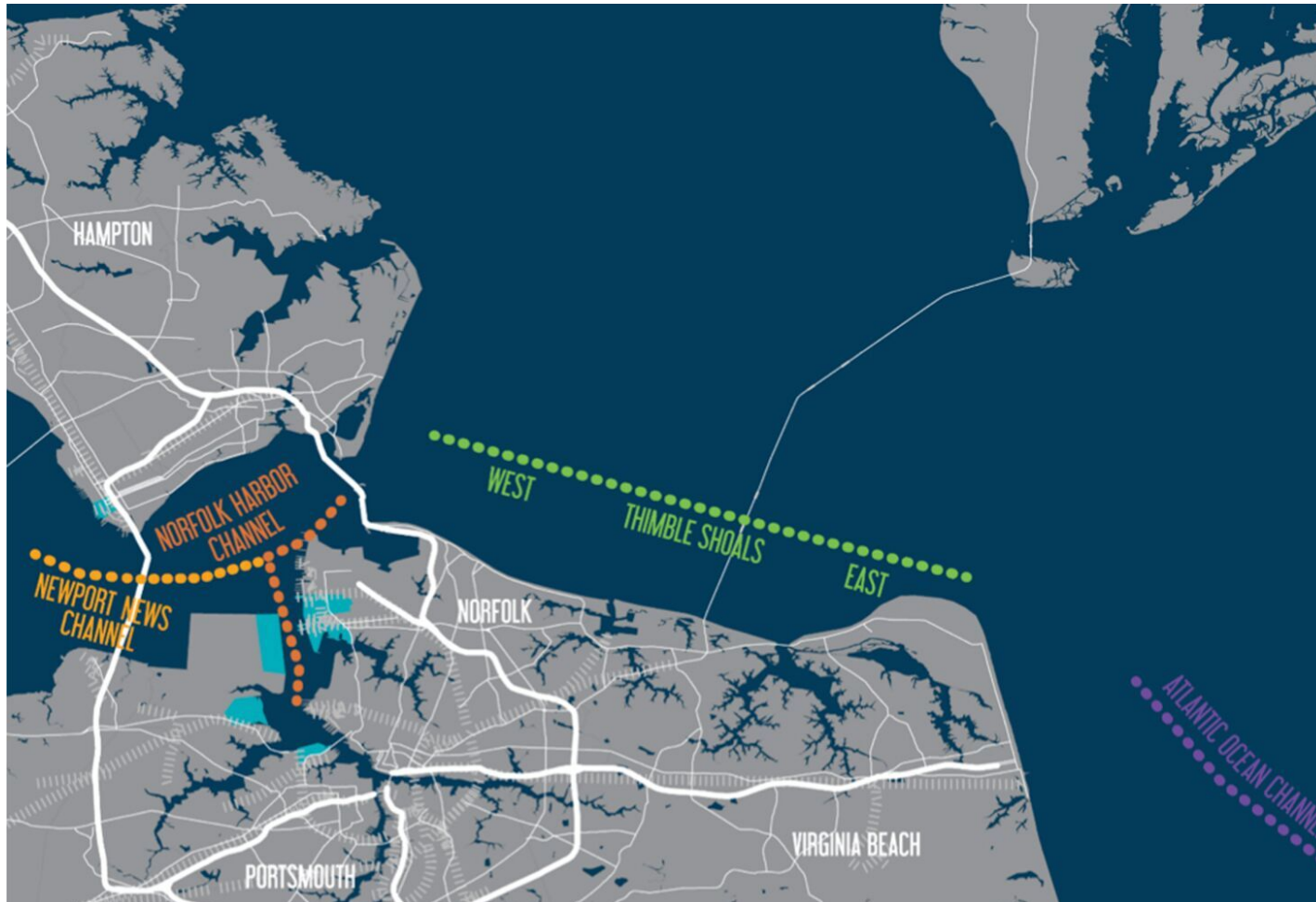
#3: Unmatched Port Infrastructure



As the second largest on the East Coast in tonnage and the third largest in container volume, Virginia's ports have the ability to handle any type of cargo. Virginia is one of the few port facilities that can offer "plug in and play" facilities to the supply chain.

Advantages

#4: Congestion-Free Navigation



Hampton Roads enjoys open shipping channels and navigational flexibility eliminating maritime congestion as a concern. The Port of Virginia is the deepest port on the East Coast and recently gained approval for a dredging project will take the channels to 55 feet deep and widen them in select areas to allow for two-way traffic of ultra-large containerhips.

Advantages

#5: Progressive Energy Policy Stance



In a bipartisan fashion, Virginia's legislature passed the Grid Transformation and Security Act in 2018, which deems 5,000 MW of solar and wind energy generation to be in the public interest.

Advantages

#6: America's Largest Shipbuilding Industry



Hampton Roads is home to the largest shipbuilding market in the United States. This provides numerous advantages in existing physical and workforce assets.

Advantages

#7: Zero Air Draft Restrictions



Virginia port facilities have direct access to sea with no overhead obstacles to impede the shipping of large and upright infrastructure and components, an advantage that differentiates it from every other East Coast state.

Advantages

#8: High-Quality Maritime Workforce



Hampton Roads boasts a civilian and military maritime labor force unmatched by any other East Coast state. Its proximity to the largest naval base in the world presents the opportunity to hire retiring military personnel for high-skilled offshore wind jobs.

Advantages

#9: Abundant Quayside Real Estate



Virginia's ports offer existing dock capacity and ample on-water marshaling areas. The Virginia coastline is geographically rich with waterfront properties and development or redevelopment opportunities.

Virginia's Offshore Wind History

Activities in Virginia – Past & Present

Virginia's Offshore Wind History

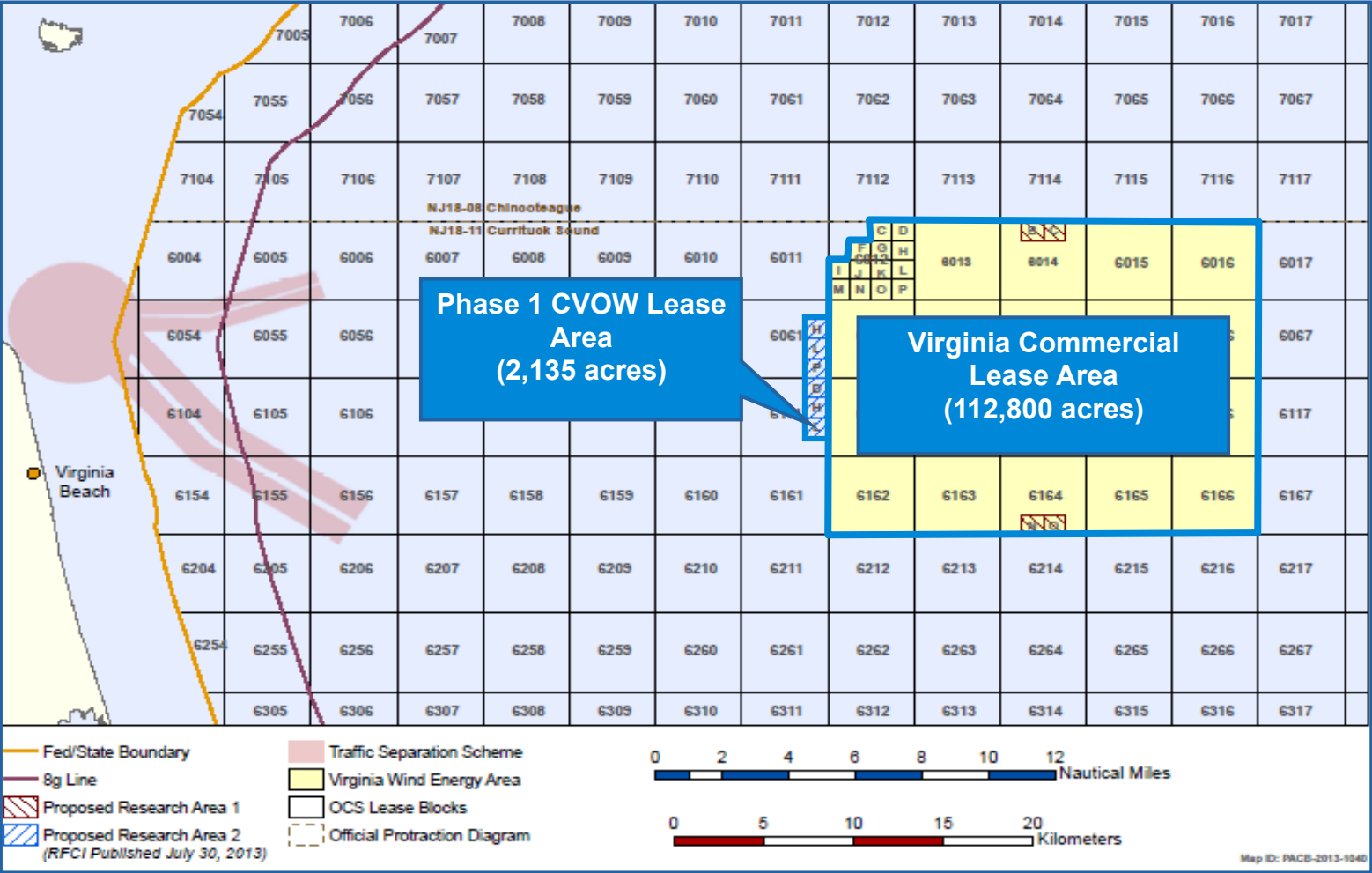


Virginia Offshore Wind Research & Development

- Virginia has the only research lease for offshore renewable energy awarded by the Bureau of Ocean Energy Management (BOEM).
- Coastal Virginia Offshore Wind (CVOW), a two-turbine, 12 MW demonstration project is slated for development in this 2,135-acre research lease (currently in the final stages of BOEM approval with a 2020 target completion date).
- This demonstration project is the precursor to the full-scale build out of the 112,800-acre Wind Energy Area (WEA) located approximately 23.5 miles offshore from the Virginia Beach coastline.
- The federal lease for this WEA was executed in November 2013 with Dominion Virginia Power, which is an investor-owned utility.
- The full build-out of this WEA has the potential to produce up to 2,000 MW of wind generation.

Virginia's Offshore Wind History

Research and Commercial Lease Areas



Virginia's Offshore Wind History



Virginia Coastal Energy Research Consortium (VCERC)

- Virginia General Assembly created VCERC in 2007 to serve as an interdisciplinary study, research and information resource for the Commonwealth on coastal energy issues.
- It provides the research and development required for the commercialization and implementation of renewable energy, specifically offshore wind and wave resources in Virginia.



Virginia Offshore Wind Development Authority (VOWDA)

- Virginia General Assembly created VOWDA for the purposes of facilitating, coordinating and supporting the development of the offshore wind energy industry, OSW energy projects and associated supply chain businesses.

Collaboration

Collaboration

Virginia Offshore Wind Port Readiness Evaluation

- Department of Mines, Minerals and Energy contracted with BVG Associates (BVGA) in 2015 to evaluate 10 Virginia ports for their readiness to accommodate seven offshore wind manufacturing and construction activities (blades, generators, nacelles, towers, foundations, cables, construction staging).
- BVGA also evaluated five Virginia commercial shipyards for their readiness to manufacture offshore substations.
- The study concluded that Virginia is well-positioned for the offshore wind industry with some needed physical improvements

Collaborative Fisheries Planning for Virginia's Offshore Wind Energy Area

- Through a collaborative effort with fishermen, we developed accurate, fine-scale maps of important fishing areas in and around the Virginia WEA
- An important outcome was establishing open communication among the commercial fishing community and all relevant governmental agencies.

Collaboration

Virginia Ocean Geophysical Survey Analysis: Virginia Offshore Wind Energy Area

- In 2013, Fugro under contract to DMME and BOEM conducted a regional geophysical survey across the offshore Virginia Wind Energy Area (WEA).
- That survey and the resulting geologic evaluation provides key, fundamental seafloor and subsurface data and geological interpretation that will help to promote, plan and further the goals of safe, economic and responsible future commercial development of the WEA.

Intergovernmental Renewable Energy Task Force

- The 134-member Task Force included representatives from Virginia state agencies, Hampton Roads local governments, Department of Defense, Navy, Air Force, Army, Coast Guard, Homeland Security, Army Corps of Engineers, Virginia Port Authority, NASA Wallops Flight Facility, etc.
- Concluded that there no conflicts with the Virginia WEA

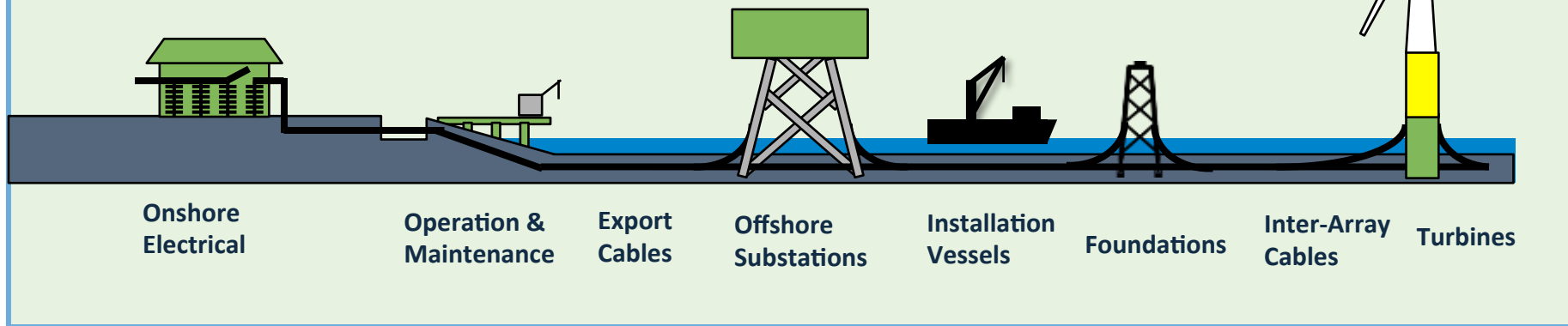
Attracting the Supply Chain and Service Industry

Supply Chain | Goals | Timeline

Attracting the Supply Chain and Service Industry

Supply Chain

Offshore wind will create economic development opportunities for Virginia's ports and commercial shipyards



Attracting the Supply Chain and Service Industry

DEVELOPMENT



- ✓ Geophysical surveys
- ✓ Geotechnical surveys
- ✓ Fisheries inspections & studies
- ✓ Marine Archaeology Impact Assessments
- ✓ Cable Burial Assessment Studies
- ✓ Studies within UXO, Met Ocean,
- ✓ Vessel inspections
- ✓ Permits
- ✓ Offshore safety training
- ✓ Harbors
- ✓ Site & Land rights

CONSTRUCTION



- ✓ Heavy structures
Foundations, Export cables,
Substation, Array cables,
Wind Turbine Generators
- ✓ Electrical components,
SCADA
- ✓ Cable Protection Systems
- ✓ Consultative engineering
- ✓ Installation vessels
- ✓ Logistic services for supplies
and crew
- ✓ Marine Warranty Surveyors
- ✓ Harbors

O&M



- ✓ O&M facilities / buildings
(design & construction)
- ✓ Furniture, office equipment/
supplies
- ✓ Temporary workers and long
term workers
- ✓ Service & maintenance
within major components
- ✓ Spare parts
- ✓ Transport of crew – crew
vessels
- ✓ Maintenance vessels
- ✓ Helicopters
- ✓ Harbors

INDUSTRIES



- ✓ Environmental consultancies
and technical experts
- ✓ Advisors within Environment,
Permits, HSE, Safety etc.
- ✓ Vessel builders / owners
- ✓ Maritime Institutes
- ✓ Archaeology institutes
- ✓ Onshore and offshore
construction
- ✓ Engineers within design/
construction
- ✓ Offshore Logistics
- ✓ Harbor facilities

Attracting the Supply Chain and Service Industry

Goals

- In May, the Department of Mines, Minerals and Energy (DMME) issued a Request for Proposals (RFP) seeking extensive offshore wind industry expertise particularly as it relates to port infrastructure requirements, build-out of the various offshore wind supply chain sectors and long-term maritime service needs.
- DMME selected BVG Associates in July to advise on the project.
- The Virginia Offshore Wind Team will conduct an opportunity analysis to illustrate Virginia's existing advantages, which will assist supply chain companies and other decision makers in their due diligence process.
- The Team will also define factors important to industry and decision makers and address how Virginia can demonstrate that it is the location of choice for the offshore wind supply chain.

Attracting the Supply Chain and Service Industry

Timeline

- The final report due late October 2018 will:
 - Serve as a partnership tool to connect industry prospects with Virginia's robust maritime industry located in Hampton Roads
 - Provide a summary of Virginia's unique advantages
 - Communicate offshore wind-related workforce development and business incentive efforts underway
 - Identify competitive gaps and make recommendations
 - Educate state and local economic development and energy policy leaders

Virginia Offshore Wind Team

Leadership | BVG Associates | Partnerships Team | Workforce Team

Business Incentives / Business Climate Team

Virginia Offshore Wind Teams

Leadership

- The Department of Mines, Minerals and Energy leads the Virginia Offshore Wind Team, which also includes representatives from the Governor's Office, Virginia Economic Development Partnership (VEDP), Virginia Port Authority (VPA) and the Virginia maritime industry.
- This Team regularly hosts site tours with globally recognized offshore wind developers, procurement and logistics experts, European foundation fabricators and other potential supply chain businesses.
- BVG Associates will assist Virginia in its aggressive pursuit of offshore wind supply chain and service industry business interests along the East Coast.

Virginia Offshore Wind Teams

BVG Associates

- BVG Associates (BVGA) is leveraging its North American and global partners with extensive OSW industry experience, including Ramboll Group A/S (Ramboll), Timmons Group (Timmons), Greentree Consulting, LLC (Greentree) and the Business Network for Offshore Wind (THE NETWORK).
- Each is deeply embedded in a different, complementary area of the offshore wind market, both domestically (e.g. VA, MA, MD, NJ, NY and RI) and internationally (e.g. Denmark, France, Germany, Norway and the United Kingdom).
- BVGA previously advised on DMME's 2015 Virginia Offshore Wind Port Readiness Evaluation, in which the firm evaluated Virginia port facilities and commercial shipyards for their readiness to accommodate offshore wind manufacturing and construction activities.

Virginia Offshore Wind Teams

Partnerships Team

- Offshore wind industry prospects have described the ability to build partnerships and utilize local assets as a primary driver in their decision-making process.
- The Partnerships Team is working with the Virginia Offshore Wind Team to educate Hampton Roads maritime asset holders and industry prospects about existing and potential supply chain candidate businesses, assets and workforce.
- We have engaged the Virginia Maritime Association (VMA) and the Virginia Ship Repair Association (VSRA), members of which are comprised of local asset owners and managers.

Virginia Offshore Wind Teams

Workforce Team

- With a maritime labor force unmatched by any other East Coast state, workforce represents a significant advantage for Virginia.
- Understanding that labor metrics alone do not alleviate risk, Virginia is working with local labor and workforce development interests to address workforce issues associated with the OSW industry. These efforts are structured to provide pathways for industry prospects and to ease workforce concerns through the creation of a talent pipeline.
- The Workforce Team provides a vital link to an existing network of recruiting and training resources and is best positioned to address and deploy strategies that further enhance the existing maritime labor pool. This Team is also looking beyond the traditional labor market to a younger generation attracted to the OSW clean energy message.

Virginia Offshore Wind Teams

Business Incentives / Business Climate Team

- Virginia's business climate advantages make it an attractive place to locate new industry. However, early adopter states in the Northeast are driving the conversation around offshore wind development through approved incentives and project bids.
- While this current activity is attracting early-adopter business to the Northeast, Virginia sees the U.S East Coast development as a long-term play. With a 20-year schedule for development that spans from Maine to South Carolina and a projected service industry lifetime of over 50 years, Virginia is a prime location for the siting of offshore wind businesses.
- Those locating in Virginia will have a competitive edge when it means the most as the industry matures and development moves down the U.S coastline.
- Development of Virginia's demonstration project and the future build-out of Virginia's Wind Energy Area further strengthen the Commonwealth's position as a natural host to many of the key offshore wind supply chain sectors.

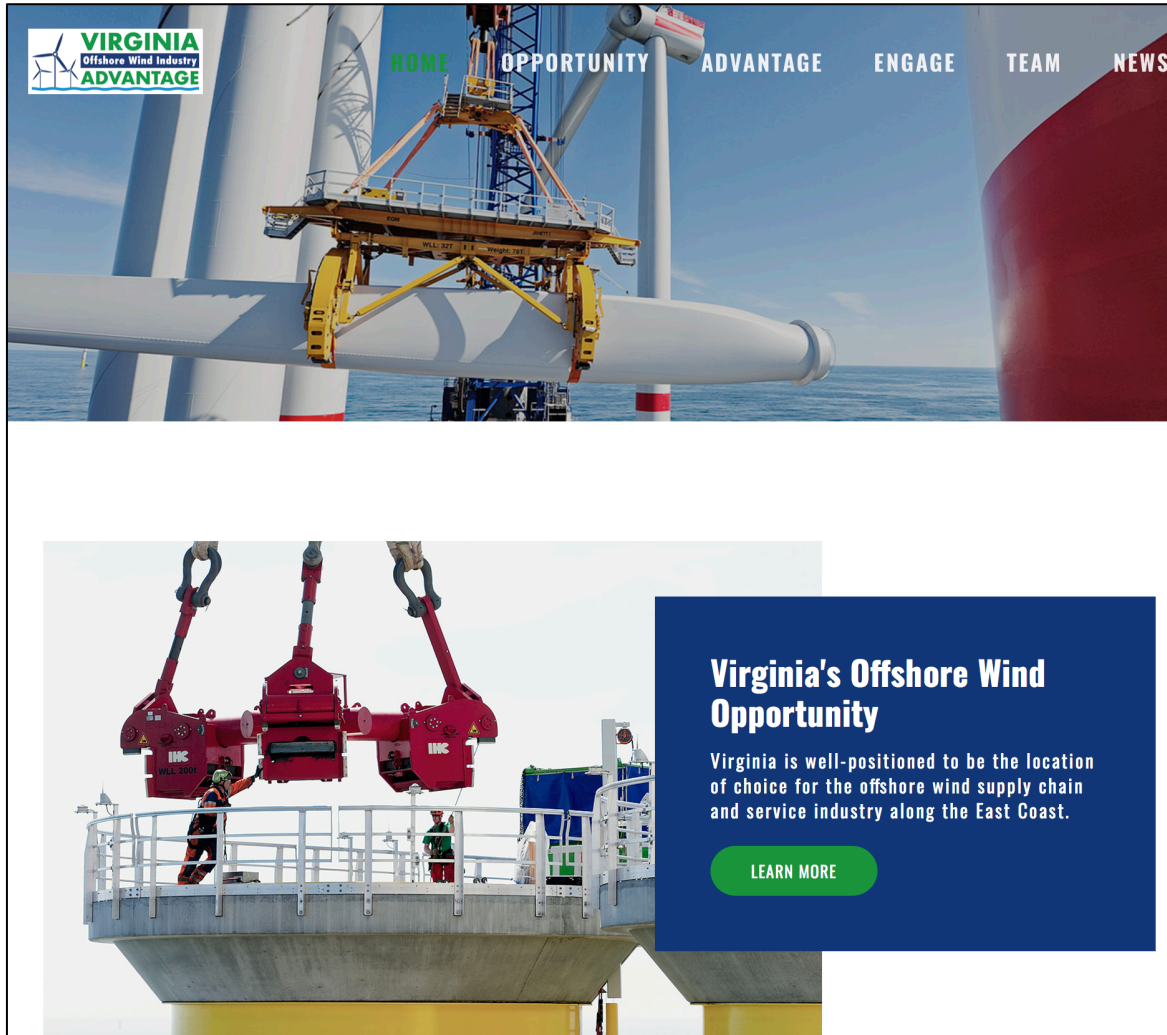
Virginia Offshore Wind Teams

Business Incentives / Business Climate Team

- Virginia seeks to build a business incentive package that compliments its business climate in order to provide clarity in available incentives and to close incentive gaps needed for long-term decision-making.
- To that end, the Virginia Offshore Wind Team has engaged with local and regional economic development offices and will consolidate existing state and local incentives as a resource for marketing offshore wind business interests.
- The Business Incentives / Business Climate Team is working on an objective analysis detailing areas in which Virginia may improve its attractiveness to the offshore wind supply chain in the form of policy and business incentives.
- The analysis also includes a review of incentives that state, regional and local economic development offices offer and recommendations to improve incentives for potential supply chain companies.

Get Involved

Get Involved



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